B9903067

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

MAR 12

3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO

G.P. 9140
5/30/80

December 2, 1980

MR. EDWARD KAGEYAMA
c/o Community Planning, Inc.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Kageyama:

Subject: Grading Memorandum
Mapele Place Agricultural Park
for Road "A" only

The roadway embankment for the above project was generally constructed with on-site and off-site soils. The fill was placed and compacted in thin layers. A soil technician from our office was present at the site on an intermittent basis to observe grading progress along the roadway and to take density tests. Whenever fill operations were on a continuous basis, a soil technician usually visited the site daily.

Grading Plan dated April 27, 1979 by Community Planning, Inc. was used as a guide for fill depths for soil testing purposes.

A tabulation of the field density test results is attached. Where low tests were noted, the area was rerolled and in most cases retested. The density test results at the time and at the locations taken were, in our opinion, in general conformance with the density requirements of the Revised Ordinances of Honolulu, 1969 As Amended.

Even though, in our opinion, the field density tests by our office conform to the density requirements of the City's Ordinance, the passage of time may result in changes in soil conditions and we suggest the following precautions:

1. Some seepage water and/or expansive soil pockets may have gone undetected during the earthwork. The site grading and design of structures will have to be adjusted or corrected as undetected conditions are encountered in the future.

2. Some creep or settlements may occur near the tops of slopes. Foundations near tops of slopes or over sloping ground should be avoided or designed under the guidance of an Engineer.

3. Site regrading by cutting, filling or altering the drainage pattern may cause ground instability in some situations. For this reason, site regrading should be avoided or made under the guidance of a Soils Engineer.

4. A settlement observation program was begun on January 28, 1980. Settlement gages were disturbed or damaged during the grading work so the program was discontinued. The level readings up to September 2, 1980 are attached.

Our work on this project does not include the following:

Finish grading or conditions resulting from finish grading work not observed and tested by our office, compaction testing of the backfill of utility trenches and drainage structures.

We have employed accepted engineering and testing procedures and our professional opinions and conclusions are made in accordance with generally accepted soil and foundation engineering principles and practices. However, we do not undertake to guarantee the construction nor do we relieve the contractor of his primary responsibility to produce a completed project conforming to the project plans and specifications.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:lw

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: November 23, 1979

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
LABORATORY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

_____ Prints
_____ Location Plan
_____ Field Density Test Results
_____ Boring Logs
__X__ Laboratory Test Results
_____ Soil Report

_____ Review and comment
_____ Approval
_____ Signature
__X__ Your use and files

No. of Copies
Sets 1
Sheets _____

General Remarks:

Based on laboratory test results, it is our opinion that the off-site borrow material may be used as select fill in Mapele Place Agricultural Park.

If changes in the material are detected, additional testing is recommended.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

MAPELE PLACE AGRICULTURAL PARK

TABLE I___ - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.				KAPAA QUARRY
SAMPLE NO.	ONSITE #1	ONSITE #1	"SELECT BORROW"	BASE COURSE
DEPTH BELOW SURFACE		NATURAL W.C.		
DESCRIPTION	MOTTLED BROWN CLAYEY SILT			
GRAIN-SIZE ANALYSIS				
(% Passing)				
Sieve				
1-1/2"			82	100
1"			65	100
1/2"			43	43
#4			25	27
#10			16	20
#20			11	12
#40			9	8
#100			6	4
#200			5	3
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL	–		
Liquid Limit	93	–		
Plastic Limit	49	–		
Plasticity Index	44	–		
Dilatancy	SLOW	–		
Toughness	MED.-STIFF	–		
Dry Strength	MED-HIGH	–		
UNIFIED SOIL CLASSIFICATION	MH	–		
APPARENT SPECIFIC GRAVITY	2.90		GW-GM	GP
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	40.3/46.0*	49.1/50.5*		
Molding Dry Density, P.C.F.	81.4	72.5		
Swell upon saturation, %	0.9	NIL		
CBR at 0.1" Penetration	20.0	3.0		
MOISTURE-DENSITY RELATIONS OF SOILS				
(ASTM D-1557-70, Method)	A	–		
Dry to Wet or Wet to Dry	DRY TO WET	–		
Max. Dry Density (P.C.F.)	83.0	–		
Optimum Moisture (%)	42.0	–		

REMARKS: MOISTURE CONTENT AFTER 4-DAY SOAK

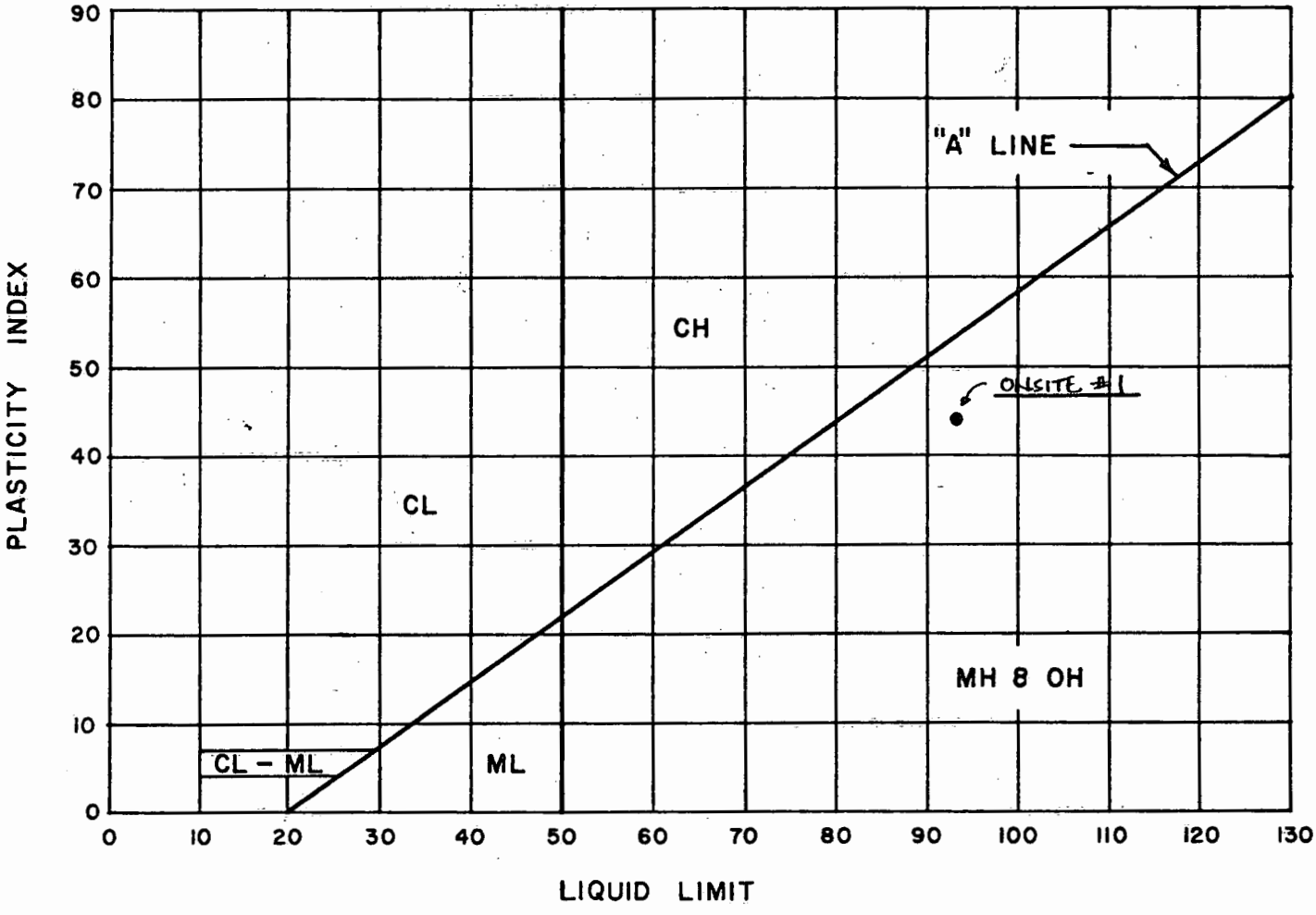
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 11-14-79 By MIC

PLASTICITY CHART

PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU, KOOLAUPOKO, OAHU, HAWAII



DATE 11-22-79 BY MIL

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

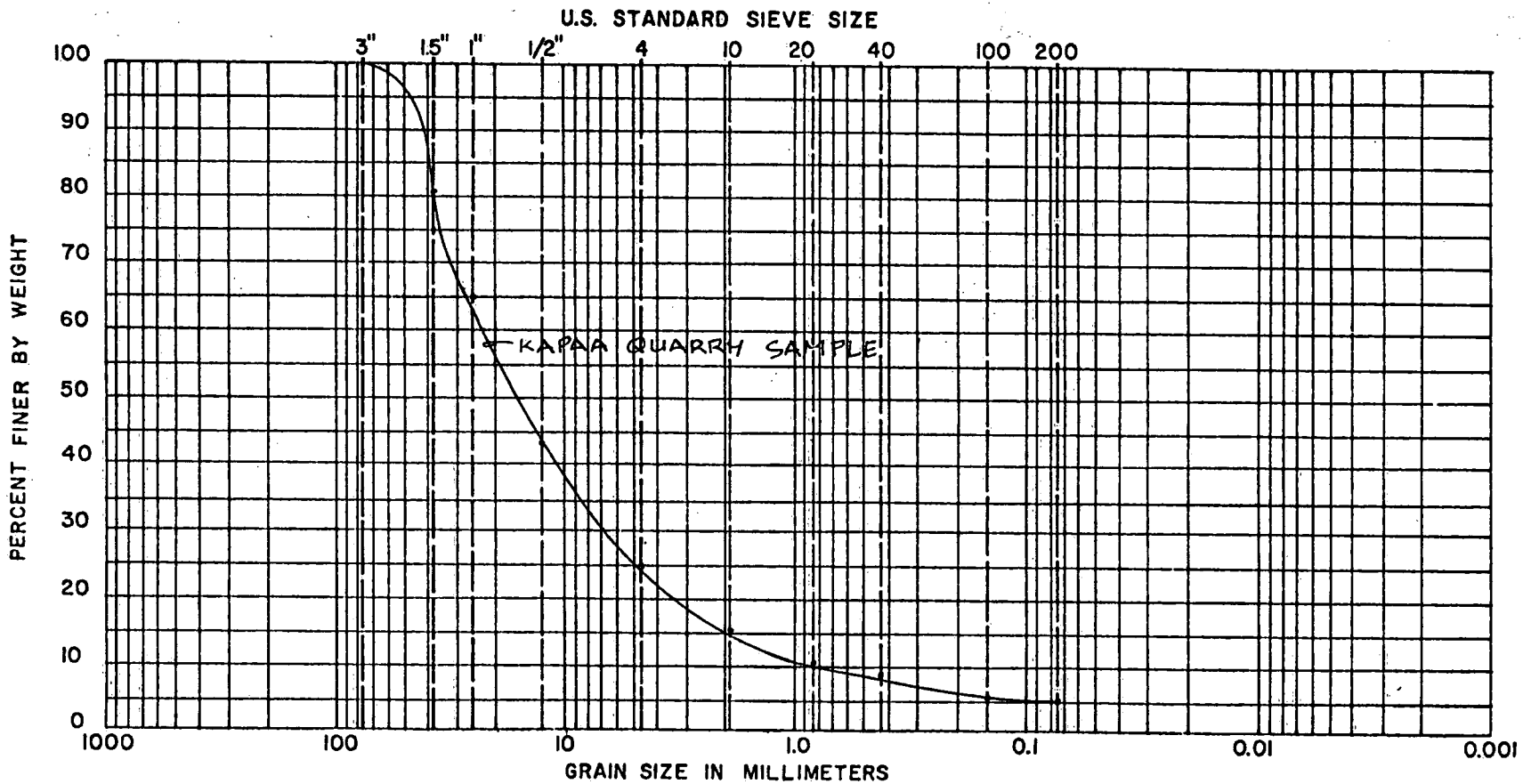
1-872

SAMPLE FROM KAPAA QUARRY

GRAIN-SIZE ANALYSIS CURVE

PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU, KOOLAUPOKO, OAHU, HAWAII



COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

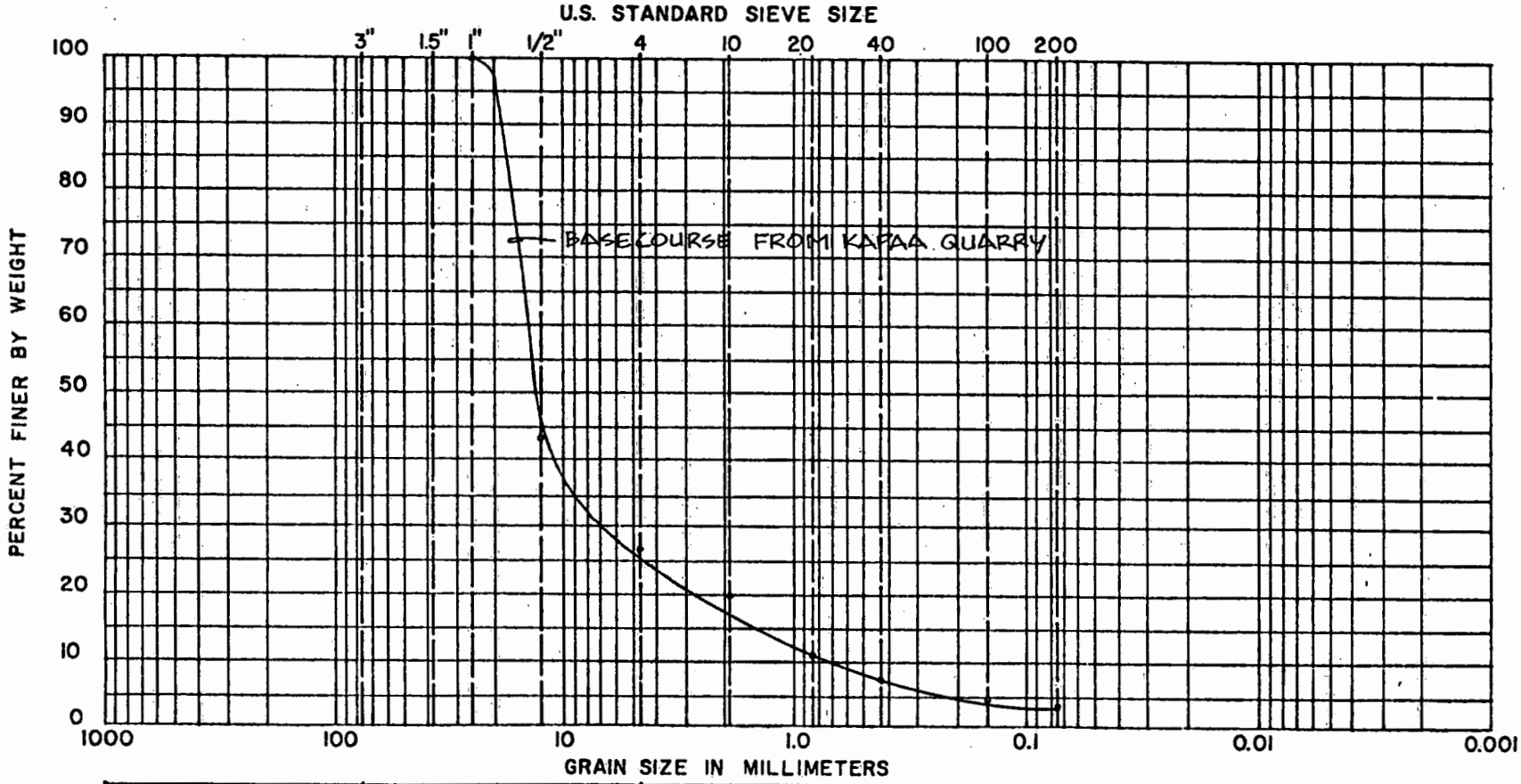
DATE 10/23/79 BY WN

BASE COURSE FROM KAPAA

GRAIN-SIZE ANALYSIS CURVE

PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU, KOOLAUPOKO, OAHU HAWAII



COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

DATE 11/1/79 BY WN

MAPELE PL. BORROW - SAMPLE #1

MOISTURE-DENSITY CURVE (ASTM D-1557-70, METHOD A)

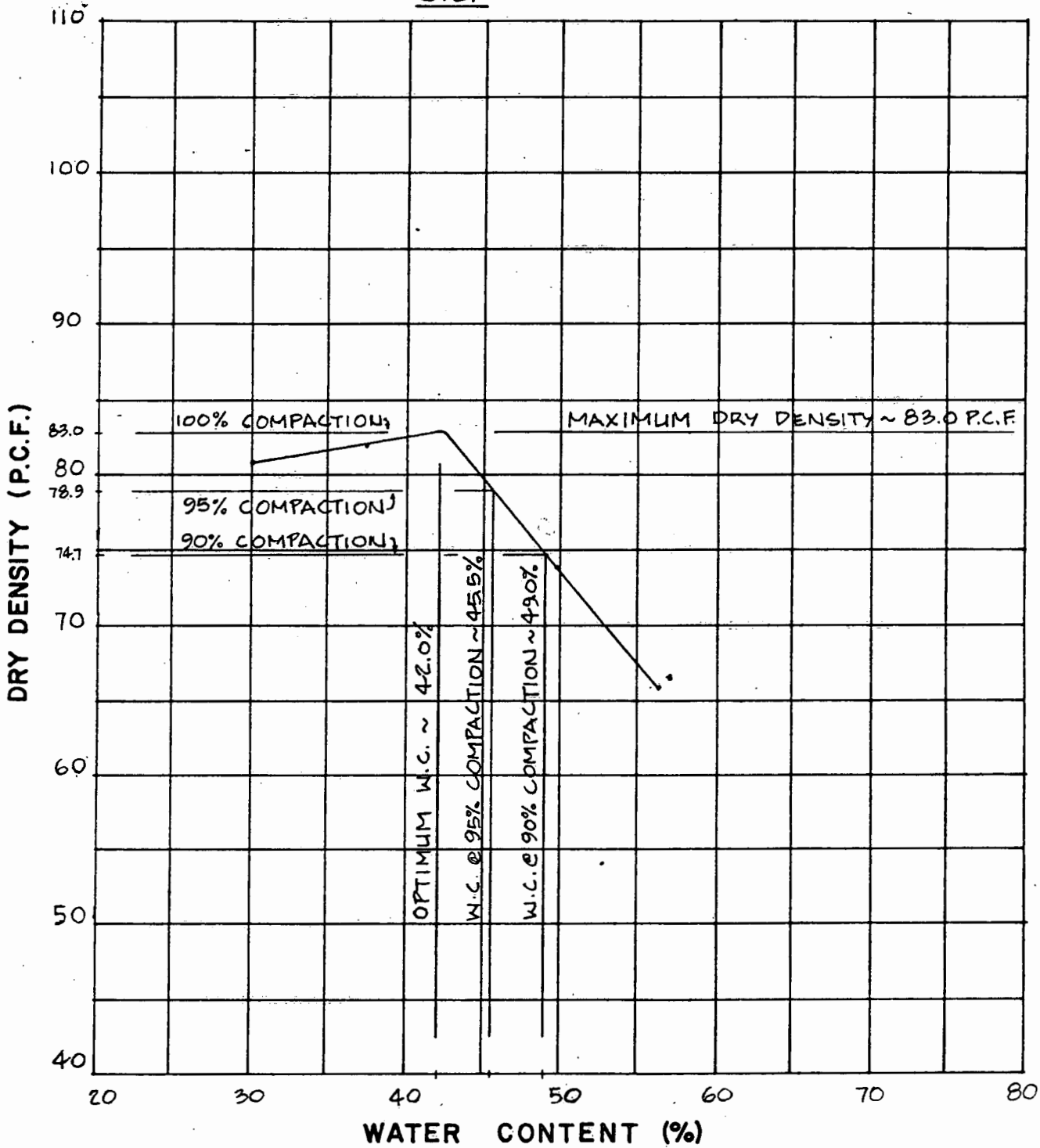
PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAUALUU, KOOLAUPOKO OAHU HAWAII

SAMPLE NO.: 1 (ONSITE)

SAMPLE DESCRIPTION: MOTTLED BROWN CLAYEY SILT

AGGREGATE: 1/4" MINUS
MOLD SIZE: 4.0"Ø X 4.584" HT.
HAMMER: 10 LBS.
LAYERS: 5
BLOWS: 25/LAYER



WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

DATE 10/22/79 BY WN

3-775

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

February 14, 1980

MEMORANDUM

TO: MR. GERALD LUM
Community Planning, Inc.

FROM: Walter Lum Associates, Inc.

RE: Mapele Place Agricultural Park

This is a follow-up of our telephone conversation regarding the localized pockets of expansive clay soil encountered in the cut slope along Road "A," between Station 10+25 to about Station 11+50 (between toe of slope and the second slope bench).

Soil samples were recovered from the face of the slope and tested in the laboratory. The soil is a highly plastic "CH" clay (Liquid Limit = 154±, P.I. = 106±) with an expansion of about 13% (CBR method). Laboratory test results are attached.

Sloughing of the slope may occur in the future and some maintenance and repair work may be required. To lessen the effect of the highly plastic clay soils, we recommend that the localized pocket be removed and replaced with a granular buttress as shown on the attached sketch.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:vl
cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

MAPLE PLACE AGRICULTURAL PARK

TABLE I___ - SUMMARY OF LABORATORY TEST RESULTS

~~BORING NO.~~	ON-SITE	ON-SITE		
SAMPLE NO.	SAMPLE #1	SAMPLE #2		
DEPTH BELOW SURFACE	(LOCALIZED POCKET)	(FROM SLOPE)		
DESCRIPTION	GRAY-BROWN CLAY	MOTTLED BROWN CLAYEY-SILT		
GRAIN-SIZE ANALYSIS				
(% Passing)				
Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL	NATURAL		
Liquid Limit	154	96		
Plastic Limit	48	52		
Plasticity Index	106	44		
Dilatancy	NONE	SLOW-NONE		
Toughness	STIFF	MED. STIFF		
Dry Strength	HIGH	MEDIUM		
UNIFIED SOIL CLASSIFICATION	CH	MH		
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	44.2	48.3		
Molding Dry Density, P.C.F.	75.2	72.4		
Swell upon saturation, %	12.9	0.9		
CBR at 0.1" Penetration	2.7	2.1		
MOISTURE-DENSITY RELATIONS OF SOILS				
(ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS:

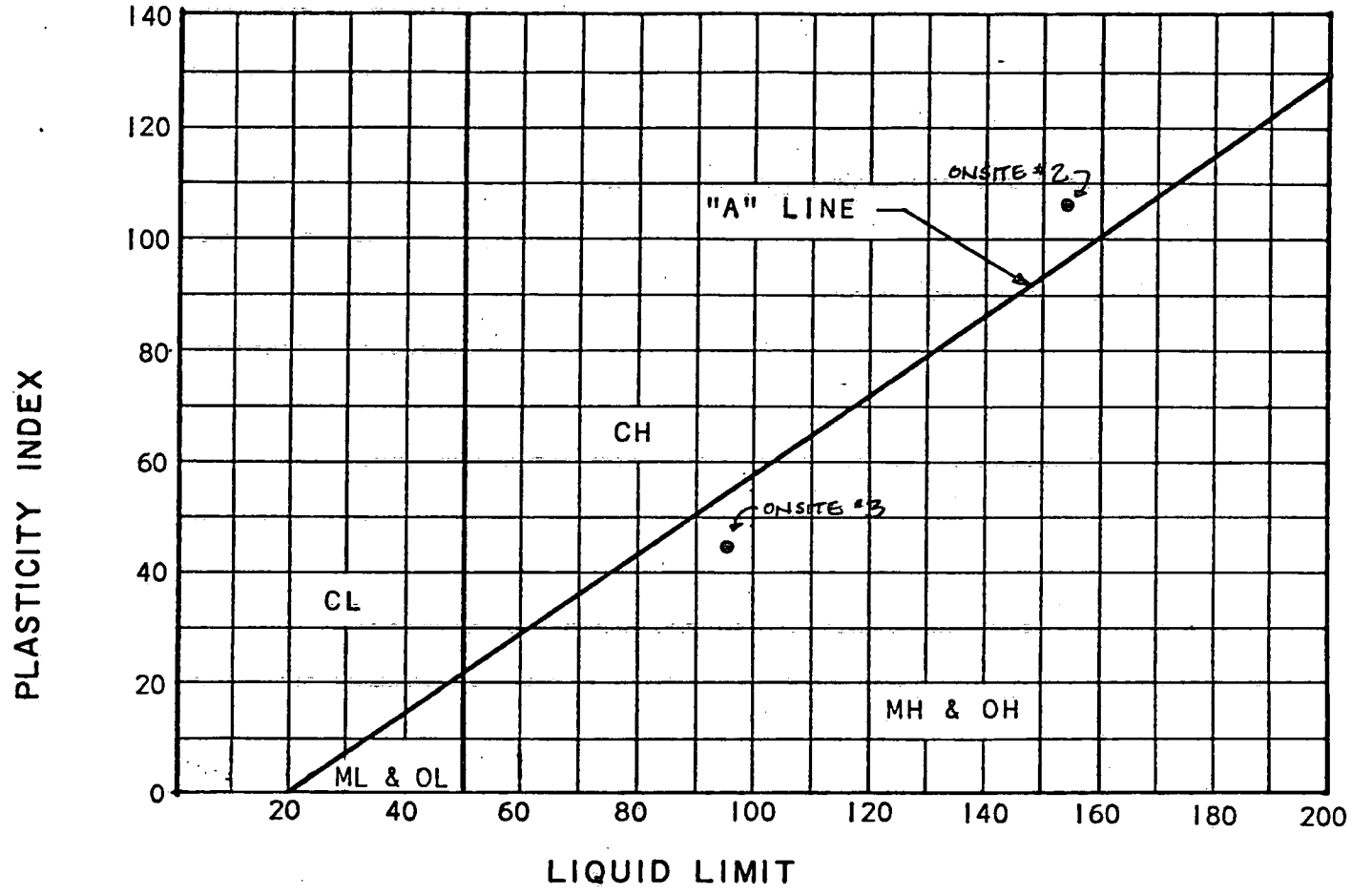
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 1-14-80 By MK

PLASTICITY CHART

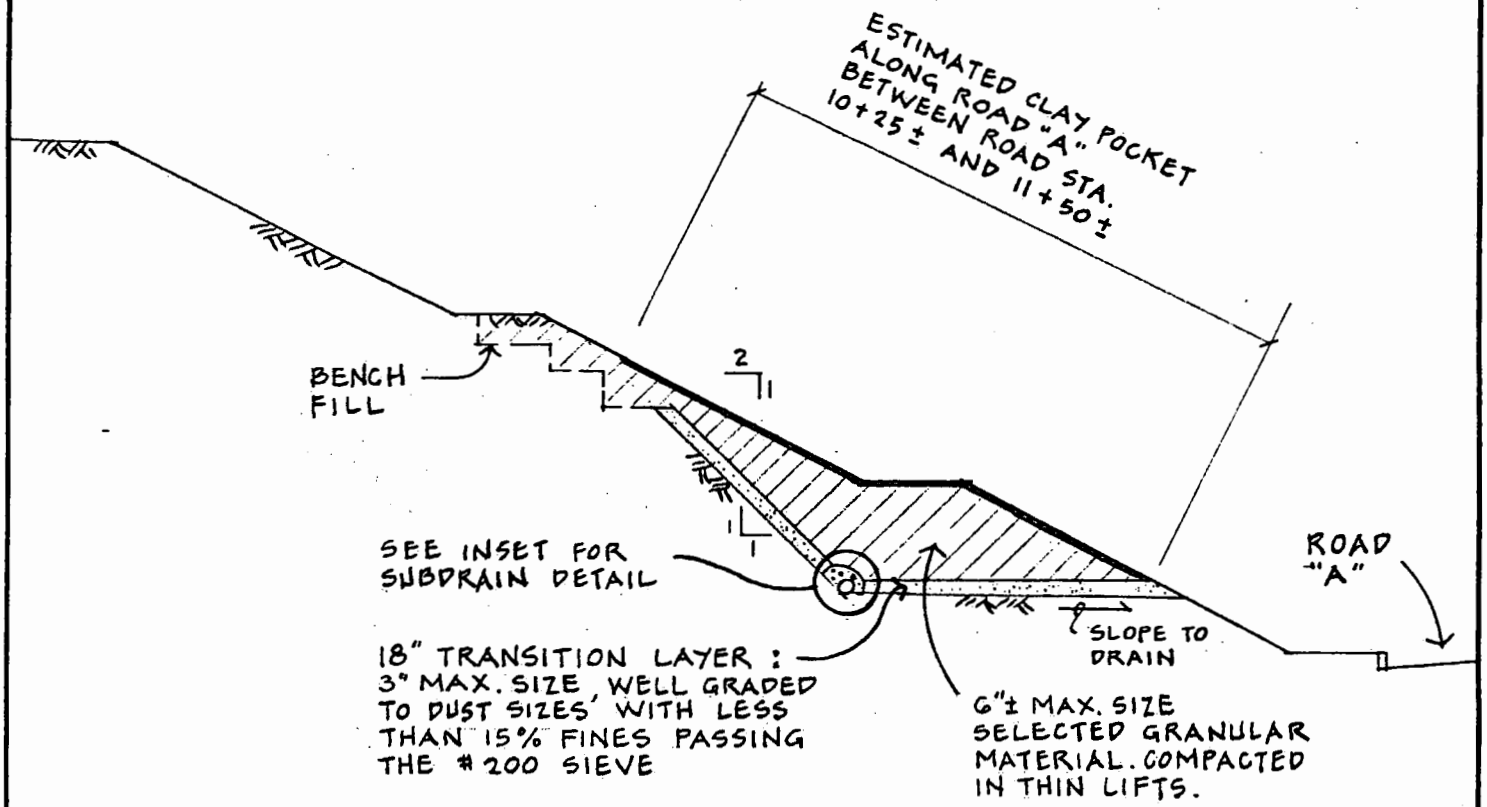
PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU KOOLAUPOKO OAHU HAWAII



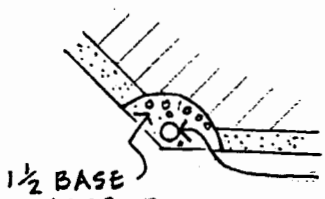
DATE 2-14-80 BY MIC

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS



TYPICAL SECTION

NOT TO SCALE



SUBDRAIN

NOT TO SCALE

BUTTRESS SKETCH
MAPELE PLACE AGRICULTURAL PARK
KAHALUU, OAHU, HAWAII

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

FEBRUARY, 1980

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: February 14, 1980

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
FIELD DENSITY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

____ Prints	____ Review and comment
____ Location Plan	____ Approval
__X__ Field Density Test Results	____ Signature
____ Boring Logs	__X__ Your use and files
____ Laboratory Test Results	
____ Soil Report	

No. of Copies
Sets 1
Sheets ____

General Remarks:

For period ending February 12, 1980.

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending FEBRUARY 12 1980 Sheet 1 of 1 Sheets

Date	ROAD "A" ~~Center~~ RD. STA. ±	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
2-4-80	STA 1+00	+1'	55.0	61.4	83	74	TO BE RETESTED
	STA 1+25	+1'	55.8	55.7	"	67	TO BE RETESTED
2-8-80	STA 0+75	+1'	55.2	61.0	83	74	TO BE RETESTED
2-11-80	STA 1+00	+1'	51.4	69.3	83	83	TO BE RETESTED
"	STA 1+00	+1'	57.3	64.8	"	81	TO BE RETESTED
2-12-80	STA 1+00	+1'	43.7	73.1	83	88	TO BE RETESTED
"	STA 1+50	+1'	42.6	70.4	"	85	TO BE RETESTED
"	STA 1+00	+1'	49.2	71.2	"	86	TO BE RETESTED

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Kikuchi

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: March 7, 1980

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
FIELD DENSITY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

____ Prints	____ Review and comment
____ Location Plan	____ Approval
_X_ Field Density Test Results	____ Signature
____ Boring Logs	_X_ Your use and files
____ Laboratory Test Results	
____ Soil Report	

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Sets 1
Sheets ____

General Remarks:

For period ending March 3, 1980.

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending MARCH 3 1980 Sheet 1 of 1 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
2-19-80	STA 1+00 RETEST	+1'	48.3	74.5	83	90	
2-20-80	STA 0+60	+2'	54.5	67.6	83	81	TO BE RETESTED
"	STA 1+20	+2'	53.6	70.6	"	85	TO BE RETESTED
2-21-80	STA 0+60 RETEST	+2'	49.3	75.6	83	91	
"	STA 1+20 RETEST	+2'	49.0	75.5	"	91	
2-23-80	STA 1+00	+3'	52.1	69.3	83	83	TO BE RETESTED
"	STA 7+80	+1'	49.4	65.4	"	79	TO BE RETESTED
"	STA 1+00	+3'	51.4	69.4	"	84	TO BE RETESTED
"	STA 7+80 RETEST	+1'	47.8	75.1	"	91	
3-3-80	STA 1+00	+3'	54.4	67.5	83	81	TO BE RETESTED
"	STA 8+00	+2'	53.7	69.4	"	84	

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D 1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Kikuchi

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: April 11, 1980

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
FIELD DENSITY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

____ Prints	____ Review and comment
____ Location Plan	____ Approval
X Field Density Test Results	____ Signature
____ Boring Logs	X Your use and files
X Laboratory Test Results	
____ Soil Report	

No. of Copies
Sets 1
Sheets ____

General Remarks:

For period ending April 11, 1980.

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending APRIL 11 1980 Sheet 1 of 7 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
3-6-80	STA 0+80 (RETEST)	+3'	47.9	69.2	83	83	TO BE REROLLED & RETESTED
"	STA 8+00 (RETEST)	+2'	45.5	75.6	"	91	
3-28-80	STA 0+80 (RETEST)	+3'	48.0	72.4	83	87	TO BE REROLLED & RETESTED
"	STA 8+00 (RETEST)	+3'	46.9	75.7	"	91	
3-31-80	STA 1+00 (RETEST)	+3	54.3	67.7	83	82	TO BE REROLLED & RETESTED
"	STA 8+00	+4'	47.1	76.2	"	92	
4-7-80	STA 7+50	+5'	48.1	69.8	83	84	TO BE REROLLED & RETESTED
4-9-80	STA 1+00 (RETEST)	+3'	45.7	74.4	83	90	
"	STA 7+50 (RETEST)	+5'	52.8	66.6	"	80	TO BE REROLLED & RETESTED
"	STA 12+00	+1'	49.7	67.5	"	81	TO BE REROLLED & RETESTED
4-11-80	STA 1+00	2.5'	42.1	78.7	83	95	
"	STA 7+50	+5'	51.9	68.7	"	83	TO BE REROLLED & RETESTED

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Kikuchi

MAPELE PLACE AGRICULTURAL PARK

TABLE I___ - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	OFFSITE CORAL			
SAMPLE NO.				
DEPTH BELOW SURFACE				
DESCRIPTION	TAN-WHITE GRAVELLY SAND (CORAL)			
GRAIN-SIZE ANALYSIS				
(% Passing)				
Sieve				
1-1/2"	98			
1"	87			
1/2"	80			
#4	76			
#10	68			
#20	52			
#40	40			
#100	15			
#200	4			
ATTERBERG LIMITS				
Air Dried or Natural				
Liquid Limit				
Plastic Limit				
Plasticity Index				
Dilatancy				
Toughness				
Dry Strength				
UNIFIED SOIL CLASSIFICATION	SP			
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	18.0/21.7*			
Molding Dry Density, P.C.F.	100.7			
Swell upon saturation, %	NIL			
CBR at 0.1" Penetration	50.0			
MOISTURE-DENSITY RELATIONS OF SOILS				
(ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK

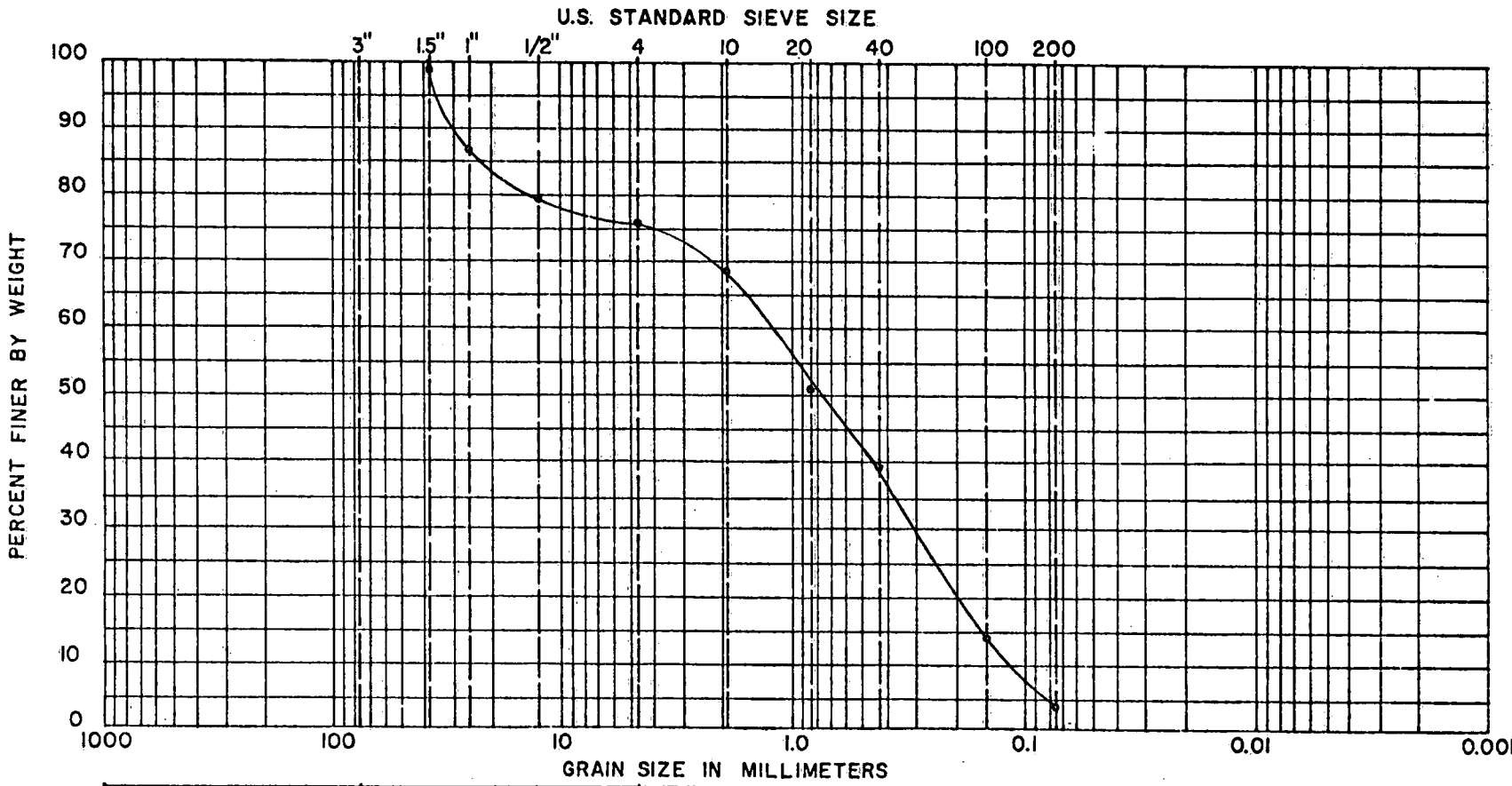
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 3-31-80 By MIC

GRAIN-SIZE ANALYSIS CURVE

PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU, KOOLAUPOKO, OAHU, HAWAII



COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

DATE 3-6-80 BY SM

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: June 17, 1980

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
FIELD DENSITY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

____ Prints	____ Review and comment
____ Location Plan	____ Approval
X Field Density Test Results	____ Signature
____ Boring Logs	X Your use and files
____ Laboratory Test Results	
____ Soil Report	

No. of Copies
Sets 1
Sheets ____

General Remarks:

For period ending June 9, 1980.

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By A. Watanabe

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending JUNE 9 1980 Sheet 1 of 2 Sheets

Date	STATION NO.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
4-28-80	8+00 (RETEST)	3'±	44.7	73.2	83	88	TO BE REROLLED & RETESTED
"	1+00	1.5'±	50.2	62.6	"	75	↓
4-29-80	8+00 (RETEST)	3'±	43.9	78.3	83	94	
5-2-80	1+00 (RETEST)	1.5'±	41.7	63.4	83	76	TO BE REROLLED & RETESTED
"	8+70	3'±	49.9	65.9	"	79	↓
5-7-80	1+25 (RETEST)	1.5'±	40.0	79.7	83	96	
"	8+70 (RETEST)	3'±	47.9	74.6	"	90	
5-12-80	0+75	0.5'±	45.9	68.3	83	82	TO BE REROLLED & RETESTED
"	7+25	3'±	47.5	67.9	"	82	↓
5-13-80	0+75 (RETEST)	0.5'±	52.7	68.5	83	83	TO BE REROLLED & RETESTED
"	7+25 (RETEST)	3'±	51.8	68.2	"	82	↓

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Kikuchi

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
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FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending JUNE 9 1980 Sheet 2 of 2 Sheets

Date	STATION NO.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
5-14-80	7+25 (RETEST)	3'±	46.5	75.1	83	90	
"	0+75 (RETEST)	0.5'±	50.2	71.4	"	86	TO BE REROLLED & RETESTED
5-20-80	0+75 (RETEST)	0.5'±	46.1	73.1	83	88	TO BE REROLLED & RETESTED
"	7+25 (RETEST)	3'±	43.9	76.2	"	92	
5-30-80	1+15 (RETEST)	0.5'±	45.4	74.9	83.0	90	TO BE REROLLED & RETESTED
6-8-80	9+00	2'±	45.1	71.8	83	87	TO BE REROLLED & RETESTED
6-9-80	9+00	2'±	44.1	77.8	83	94	

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Lum

1-675

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

July 14, 1980

COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

Gentlemen:

Subject: Mapele Place Agricultural Park
Pavement Thickness Recommendations

As requested, soil samples were taken from the existing road subgrade at about Stations 1+00 and 7+50 and tested in our laboratory to estimate pavement thickness design guides.

Four CBR tests were conducted for each sample at varying water contents. Because the site is located in a fairly wet area with natural water contents generally between 40 to 50%, laboratory tests were performed over the range of water contents and densities that were generally expected during the construction period. Our recommended pavement thicknesses and laboratory test results are attached.

Where localized soft pockets are encountered at subgrade level, they should be removed and replaced with on-site select soils compacted in thin lifts.

The subgrade should be compacted and shaped to drain. To avoid the ponding of water and softening of the subgrade at low points or sags in the roadway, weep holes should be placed at subgrade levels through the walls of catch basins.

The subgrade should be compacted on the wet side of optimum moisture, kept moist and not allowed to dry out prior to placing the subbase course.

Our professional services, in our opinion, were performed, findings obtained and recommendations prepared in accordance with generally accepted local engineering practices. This is in lieu of all other warranties expressed or implied.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:vl
cc: Okada Trucking Co., Ltd.
Okada Trucking Co., Ltd. (Field Foreman)
Mr. Edward Kageyama,
c/o Community Planning, Inc.

July 14, 1980

MAPELE PLACE AGRICULTURAL PARK

PAVEMENT DESIGN

Sample Location	Roadway Area	Pavement Thickness: Asphalt Concrete CBR > 80	Base Course CBR > 85	Subbase Course CBR > 25	Borrow CBR > 8
Station 1+00	0+00± to 2+25±	2"	6"	6"	--
(Not tested by Walter Lum Associates, Inc.	2+25± to 3+65± (as recommended by the City)	2"	6"	6"	18"
Station 7+50	3+65± to 12+11±	2"	6"	6"	--

Note:

Field adjustments to the recommended pavement thickness may be required where soft localized pockets or clay pockets are encountered near the recommended subgrade.

MAPELE PLACE AGRICULTURAL PARK

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	STA 1+00			
SAMPLE NO.				
DEPTH BELOW SURFACE				
DESCRIPTION	MOTTLED BROWN CLAYEY SILT		MOTTLED BROWN CLAYEY SILT.	
GRAIN-SIZE ANALYSIS (% Passing) Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL			
Liquid Limit	90			
Plastic Limit	48			
Plasticity Index	42			
Dilatancy	SLOW			
Toughness	MED.-STIFF			
Dry Strength	MEDIUM			
UNIFIED SOIL CLASSIFICATION	MH			
APPARENT SPECIFIC GRAVITY				
CBR TEST (Surcharge - 51 P.S.F.)				
Molding Moisture, %	40.6 / 49.6*	42.3 / 46.8*	45.6 / 46.5*	47.9 / 49.1*
Molding Dry Density, P.C.F.	81.5	79.8	77.1	75.1
Swell upon saturation, %	1.3	0.6	0.2	0.2
CBR at 0.1" Penetration	18.0	25	14.7	13.0
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 7-8-80 By ML

MAPELE PLACE AGRICULTURAL PARK

TABLE I B - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	STA 7+50			
SAMPLE NO.				
DEPTH BELOW SURFACE				
DESCRIPTION	MOTTLED BROWN CLAYEY SILT			
GRAIN-SIZE ANALYSIS				
(% Passing)				
Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL			
Liquid Limit	96			
Plastic Limit	45			
Plasticity Index	51			
Dilatancy	SLOW			
Toughness	MED.-STIFF			
Dry Strength	MEDIUM			
UNIFIED SOIL CLASSIFICATION	MH			
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	37.7 / 55.8*	42.2 / 50.0*	47.1 / 51.1*	47.4 / 50.0*
Molding Dry Density, P.C.F.	81.1	79.0	74.9	74.6
Swell upon saturation, %	4.0	0.4	0.3	0.2
CBR at 0.1" Penetration	9.2	18.3	13.1	12.0
MOISTURE-DENSITY RELATIONS OF SOILS				
(ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 7-06-8 By MK

MAPELE PLACE AGRICULTURAL PARK

TABLE IC - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	ONSITE			
SAMPLE NO.	#1			
DEPTH BELOW SURFACE				
DESCRIPTION	MOTTLED BROWN CLAYEY SILT			
GRAIN-SIZE ANALYSIS (% Passing) Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL**			
Liquid Limit	93			
Plastic Limit	49			
Plasticity Index	44			
Dilatancy	SLOW			
Toughness	MED-STIFF			
Dry Strength	MED.-HIGH			
UNIFIED SOIL CLASSIFICATION	MH **			
APPARENT SPECIFIC GRAVITY	2.90 **			
CBR TEST (Surcharge - 5I P.S.F.)				
Molding Moisture, %	40.3/46.0**▲			
Molding Dry Density, P.C.F.	81.4			
Swell upon saturation, %	0.9			
CBR at 0.1" Penetration	20.0			
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)	A **			
Dry to Wet or Wet to Dry	DRY TO WET			
Max. Dry Density (P.C.F.)	83			
Optimum Moisture (%)	42.0			

REMARKS: ▲ MOISTURE CONTENT AFTER 4-DAY SOAK

** NOTE: ONSITE #1 SAMPLE LABORATORY TEST RESULTS PREVIOUSLY SUBMITTED (11-23-79)

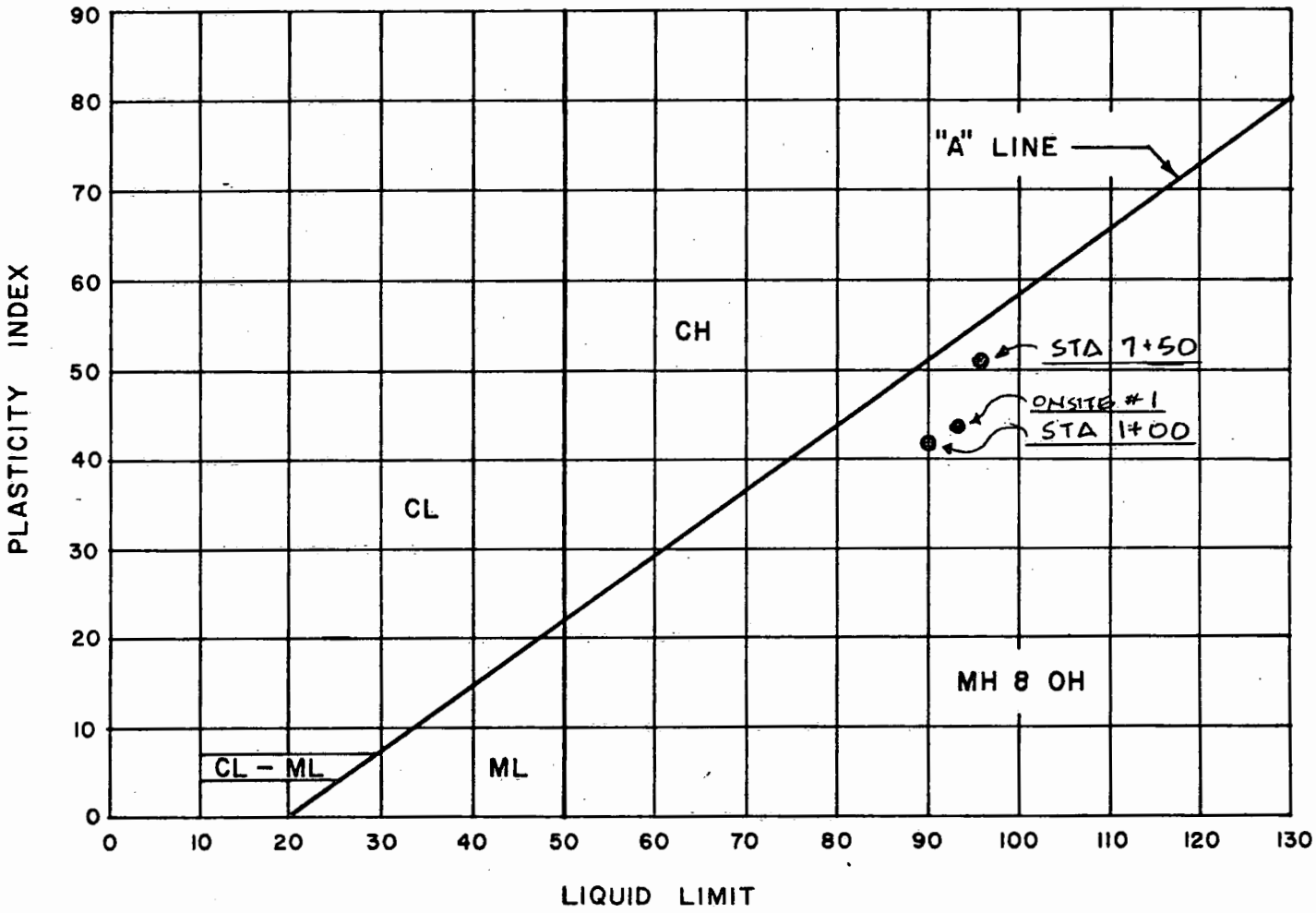
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 7-14-80 By MK

PLASTICITY CHART

PROJECT: MAPELE PLACE AGRICULTURAL PARK

LOCATION: KAHALUU, KOOLAUPOKO, OAHU, HAWAII



DATE 7-7-80 BY MK

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

TRANSMITTAL FORM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: COMMUNITY PLANNING, INC.
Suite 608, 700 Bishop Street
Honolulu, Hawaii 96813

DATE: August 7, 1980

Gentlemen:

Re: MAPELE PLACE AGRICULTURAL PARK
FIELD DENSITY TEST REPORT

We Are Sending You Herewith [X] Under Separate Cover [ ]

____ Prints	____ Review and comment
____ Location Plan	____ Approval
X Field Density Test Results	____ Signature
____ Boring Logs	X Your use and files
____ Laboratory Test Results	
____ Soil Report	

No. of Copies
Sets 1
Sheets ____

General Remarks:

For period ending July 1, 1980.

cc: Okada Trucking Co., Ltd.
Mr. Edward Kageyama,
c/o Community Planning, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

FIELD DENSITY TEST REPORT

MAPELE PLACE AGRICULTURAL PARK

Field Density Test Results as follows:

Ending JULY 1 1980 Sheet 1 of 1 Sheets

Date	ROAD "A" ~~Lot No.~~	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***	
6-15-80	STA 1+20	2'±	44.5	78.4	83	94	
"	STA 9+00	2'±	48.5	71.5	"	86	TO BE REROLLED & RETESTED
6-26-80	STA 9+00 (RETEST)	2'±	43.8	80.3	83	97	
6-30-80	STA 1+00	1'± *	41.9	79.1	83	95	
7-1-80	STA 8+20	1'± *	40.2	81.6	83	98	
	NOTE:						
	* COMPACTION TESTING AT FINISHED SUBGRADE						
	TO BE DONE BY CITY'S TESTING LABORATORY						
	PER CITY'S INSPECTOR.						

* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

◯ Indicates Test ..... taken in the ..... shown.

BY M. Kikuchi

I-675

Transmittal Form

Lab

COMMUNITY PLANNING, INC.
CONSULTANT PLANNERS • CIVIL ENGINEERS • SURVEYORS

700 BISHOP ST., SUITE 608
HONOLULU, HAWAII 96813
PHONE 531-4252, 521-7491

TO: Walter Lum Associates, Inc.
3030 Waialae Avenue
Honolulu, Hawaii

DATE: September 4, 1980

☒ Mail
☐ Deliver
☐ Pick-up

Attention Mr. Wallace Wakahiro

Gentlemen:

RE: Mapele Place Agricultural Park

We transmit herewith ☒ **Under separate cover** ☐

No. of Copies	Description
1	Post Settlement Gage readings taken on September 2, 1980

FOR:
_____ Approval
_X_ Information/Use
_____ Review & Comments
_X_ File

Remarks:

RECEIVED
SEP 5 1980
WALTER LUM ASSOCIATES, INC.

Very truly yours,

By Bernard P. Kea

Bernard P. Kea

FB 327 MAPLE PLACE SUBD. - GAGES

GAGE No.	DATE																	
	1-28-80	2-7-80	2-14-80	2-22-80	3-5-80	3-12-80	3-21-80	3-27-80	4-2-80	4-16-80	5-2-80	6-5-80	6-17-80	8-6-80	8-21	9-2		
#1	68.56	68.55	68.55	68.51	68.53	68.52	68.51	68.48	68.49	68.49	68.49	71.44	OUT					
#2			109.35	Moving	out			New	114.84	114.82	114.82	114.80	114.82					
#3				94.09	94.05	94.00	93.98	93.99	93.99	93.96	93.96	94.43	94.14					
										POST	FILL	GAGE						
												1		70.23	70.22	70.23		
												2		107.30	107.35	107.31		